

CLAIMS

What is claimed is:

1. A field assembly for an electric motor, the field assembly comprising:

5 a field core a winding support structure;
wire redirection structure supported by the field core; and
a winding selectively wound on the winding support in one of a
first direction, to provide a first polarity, and a second direction, to provide a
second polarity, the second polarity being different than the first polarity, in one
10 of the first direction and the second direction, the winding being wound on the
winding support structure and the wire redirection structure.

2. A field assembly as claimed in claim 1, and further comprising a
terminal plate connected to the field core.

15 3. A field assembly as claimed in claim 2, wherein the terminal plate
is formed of an insulated material.

20 4. A field assembly as claimed in claim 1, wherein the wire
redirection structure includes a first post and a second post, in the one of the first
direction and the second direction, the winding being wound on the first post, the
winding support structure, and the second post.

25 5. A field assembly as claimed in Claim 4, wherein, in the first
direction, the winding is not wound on the first post and the second post.

6. A field assembly as claimed in Claim 4, wherein, in the second direction, the winding is wound on the first post and the second post.

5 7. A field assembly as claimed in claim 4, wherein the field core includes a first terminal assembly supported by the terminal plate and a second terminal assembly supported by the terminal plate, the winding having a first lead a second lead, and an intermediate portion between the first lead and the second lead, wherein, in the one of the first direction and the second direction, the first
10 lead is connected to the first terminal assembly, the intermediate portion is wound around the first post, the winding support structure, and the second post, and the second lead is connected to the second terminal assembly.

8. A field assembly as claimed in claim 7, wherein the wire
15 redirection structure, a portion of the first terminal assembly and a portion of the second terminal assembly are formed on a terminal plate, the terminal plate being connected to the field core.

9. A field assembly as claimed in claim 7, wherein the field core has a
20 first end and a second end, and wherein the terminal plate is connected to the first end of the field core such that the wire redirection structure and the first terminal assembly and the second terminal assembly are positioned on the first end of the field core.

10. A field assembly as claimed in claim 1, wherein, in the first direction, the winding is not wound on the wire redirection structure.

11. A field assembly as claimed in claim 1, wherein, in the second
5 direction, the winding is wound on the wire redirection structure.

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12. A field assembly for an electric motor, the field assembly comprising:

a field core having a first end and a second end, the field core including a winding support structure, a first terminal assembly, and a second terminal assembly;

a terminal plate connected to the first end of the field core, the terminal plate supporting the first terminal assembly and the second terminal assembly;

a wire redirection structure supported on the field core; and

a winding selectively wound on the field core in one of a first direction, to provide a first polarity, and a second direction, to provide a second polarity, the second polarity being different than the first polarity, in one of the first direction and the second direction, the winding being wound on the winding support structure and the wire redirection structure, in the other of the first direction and the second direction, the winding being wound on the winding support structure and not being wound on the wire redirection structure.

13. A field assembly as claimed in claim 12, wherein the terminal plate is formed of an insulated material.



14. A field assembly as claimed in claim 12, wherein the winding has a first lead, a second lead, and an intermediate portion between the first lead and the second lead, wherein, to selectively wind the winding in the first direction, the first lead is connected to the first terminal assembly, the intermediate portion is wound around the winding support structure, and the second lead is connected to the second terminal assembly.

15. A field assembly as claimed in claim 12, wherein the wire redirection structure includes a first post and a second post, wherein in the one of the first direction and the second direction, the winding is wound on the winding support structure, the first post and the second post.

16. A field assembly as claimed in claim 15, wherein the winding has a first lead, a second lead, and an intermediate portion between the first lead and the second lead, wherein, to selectively wind the winding in the second direction, the first lead is connected to the first terminal assembly, the intermediate portion is wound around the first post, the winding support structure, and the second post, and the second lead is connected to the second terminal assembly.

17. A field assembly as claimed in claim 12, wherein, to selectively wind the winding in the first direction, the winding is not wound on the wire redirection structure.

18. A field assembly as claimed in claim 12, wherein, to selectively wind the winding in the second direction, the winding is wound on the wire redirection structure.

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19.

A method for assembling a field assembly, the field assembly including a field core including a winding support structure, a wire redirection structure and a winding selectively wound on the field core, the method comprising the acts of:

5 selecting a polarity of the field assembly from one of a first polarity and a second polarity, the second polarity being different than the first polarity; and

 winding the winding onto the field core in a direction corresponding to the selected polarity, the winding act including selectively
10 winding the winding in one of a first direction, to provide the first polarity, and a second direction, to provide the second polarity, in one of the first direction and the second direction, the winding act including winding the winding on the winding support structure and the wire redirection structure, in the other of the first direction and the second direction, the winding act including winding the
15 winding on the winding support structure and not winding the winding on the wire redirection structure.

20. A method as claimed in claim 19, wherein the winding has a first lead and a second lead, wherein the field assembly further includes a first terminal
20 assembly and a second terminal assembly, and wherein the method further comprises the acts of:

 connecting the first lead to the first terminal assembly; and
 connecting the second lead to the second terminal assembly.

21. A method as claimed in claim 20, wherein the act of connecting the first lead precedes the winding act.

22. A method as claimed in claim 21, wherein the act of connecting the second lead follows the winding act.

23. A method as claimed in claim 19, wherein, to provide the second polarity, the winding act includes winding the winding on the wire redirection structure.

24. A method as set forth in claim 23, wherein, to provide the first polarity, the winding act includes not winding the winding on the wire redirection structure.

25. A method as claimed in claim 23, wherein the winding has a first lead and a second lead, wherein the field assembly further includes a first terminal assembly and a second terminal assembly, and wherein the method further comprises the acts of:

before the winding act, connecting the first lead to the first terminal assembly; and

after the winding act, connecting the second lead to the second terminal assembly.

26. A method for assembling a power tool, the method comprising the acts of:

providing a housing;

5 providing an electric motor connectable to a power source to drive a tool element, the electric motor including a field assembly, an arbor rotatably supportable by the housing and an electrical circuit for connecting the motor to the power source, the field assembly including a field core including a winding support structure, wire redirection structure and a winding;

10 selecting a polarity of the field assembly from one of a first polarity and a second polarity, the second polarity being different than the first polarity;

15 winding the wire onto the field core in a direction corresponding to the selected polarity, the winding act including selectively winding in one of a first direction, to provide a first polarity, and a second direction, to provide a second polarity, in one of the first direction and the second direction, the winding act including winding the winding on the winding support structure and the wire redirection structure, in the other of the first direction and the second direction, the winding act including winding the winding on the winding support structure and not winding the winding on the wire redirection structure;

20 supporting the field assembly in the housing;

rotatably supporting the arbor in the housing; and

connecting the field assembly and the arbor to the electrical circuit so that, when the motor is connected to the power source, the arbor is rotatably driven in a rotational direction corresponding to the selected polarity of the field assembly.

27. A field assembly for an electric motor, the field assembly comprising:

a field core having a first end and a second end, the field core including a winding support structure, a first terminal assembly, and a second terminal assembly;

a terminal plate connected to the first end of the field core, the terminal plate supporting the first terminal assembly and the second terminal assembly;

a wire redirection structure supported on the field core; and

a first winding selectively wound on the field core in one of a first direction, to provide a first winding first polarity, and a second direction, to provide a first winding second polarity, the first winding second polarity being different than the first winding first polarity, in one of the first direction and the second direction, the first winding being wound on the winding support structure and the wire redirection structure, in the other of the first direction and the second direction, the first winding being wound on the winding support structure and not being wound on the wire redirection structure;

a second winding selectively wound on the field core in one of a third direction, to provide a second winding first polarity, and a second direction, to provide a second winding second polarity, the second winding second polarity being different than the second winding first polarity, in one of the third direction and the fourth direction, the second winding being wound on the winding support structure and the wire redirection structure, in the other of the third direction and the fourth direction, the second winding being wound on the winding support structure and not being wound on the wire redirection structure.

28. A field assembly as claimed in claim 27, wherein the first winding is a run coil.

5 29. A field assembly as claimed in claim 27, wherein the second winding is a brake coil.

30. A field assembly as claimed in claim 27, wherein the winding support structure includes a first winding support and a second winding support,
10 wherein the first winding includes a first portion wound on the first winding support, a second portion wound on the second winding support, and a cross-over portion connecting the first portion and the second portion.

31. A field assembly as claimed in claim 30, wherein the second
15 winding includes a second winding first portion wound on the first winding support, a second winding second portion wound on the second winding support, and a second winding cross-over portion connecting the second winding first portion and the second winding second portion.

32. A field assembly as claimed in claim 31, wherein the first winding has a first winding first lead and a first winding second lead, wherein the second winding has a second winding first lead and a second winding second lead, wherein the field assembly further comprises a first terminal assembly, a second terminal assembly, a third terminal assembly and a fourth terminal assembly, the first winding first lead being connectable with the first terminal assembly, the first winding second lead being connectable with the second terminal assembly, the second winding first lead being connectable with the third terminal assembly, and the second winding second lead being connectable with the fourth terminal assembly.

33. A field assembly as set forth in Claim 32, wherein the first winding is a run coil, and the second winding is a brake coil.

34. A field assembly as claimed in claim 27, wherein, in the first direction, the first winding is wound on the winding support and not on the wire redirection structure.

35. A field assembly as claimed in claim 34, wherein, when the first winding is wound in the first direction, the second winding is wound in the third direction, and wherein, in the third direction, the second winding is wound on the winding support structure and on the wire redirection structure.

36. A field assembly as claimed in claim 27, wherein, in the second direction, the first winding is wound on the winding support and on the wire redirection structure.

37. A field assembly as claimed in claim 36, wherein, when the first winding is wound in the second direction, the second winding is wound in the fourth direction, and wherein, in the fourth direction, the second winding is wound on the winding support structure and not on the wire redirection structure.

38. A field assembly as claimed in claim 27, wherein the wire redirection structure includes a first post and a second post, wherein in the one of the first direction and the second direction, the first winding is wound on at least one of the first post and the second post, and wherein in the one of the third direction and the fourth direction, the second winding is wound on at least one of the first post and the second post.